# SEEDING BIG DATA IN INDONESIAN CORRECTIONAL JUSTICE SYSTEM FOR INTERVENING RESTORATIVE PROGRAM: A CONCEPTUAL PAPER

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## Abstract

*Prisons are overcrowded and running out of capacity globally including Indonesia. The Indonesian justice system is claimed for irregularities and prisoner recidivism issues, thus, needs remedy than ever before to monitor prisoners' actions. To help this situation, Indonesia is enforcing a restorative justice system for post-prison rehabilitation and reintegration of people back in society. This article has addressed the restorative justice system from Big Data perspective. This might face data management issues and techniques to interpret and extract relevant information. Here, Big Data and analytic techniques are introduced for a breakthrough in Indonesian restorative justice system towards a potentially more controlled and meaningful digital era of correctional programming. Potential implications are unearthed, likewise, recommendations are limitless. Similarly, research terrain is vastly unknown which attracts further investigation in both conceptual and empirical field regarding the law, policy, and practice for overall strong Indonesian judicial system.*

**Keywords :** Restorative Justice, Big Data, Indonesia, Conceptual paper.

## I.  Introduction

Past decade has witnessed sparking growth, implications, and cost-effectiveness of tracking technologies in different fields such as tourism (Shoval, & Ahas, 2016), territorial animal tracking (Kays, Crofoot, Jetz, & Wikelski, 2015), construction job tool tracking (Goodrum, Mc Laren, & Durfee, 2006), and healthcare settings (Miyamoto, Henderson, Young, Pande, & Han, 2016). Moreover, minor

crimes with imprisonment penalties by the conventional justice system have shown an increased rate of reoffending practices (Nagin, Cullen, & Jonson, 2009). Whereas, population growth is also pushing prison capacity with an increased number of offenders dumped into jails which are reported at 20% more rate than the population growth rate by Walmsley (2016). However, the Netherlands observed a decrease in prison population by 46% between 2006 and 2016. Again, the cause is unclear yet, renewed focus need is on crime prevention and the use of electronic monitoring (Dünkel, 2016). While tracking for improvement and societal well-being of offenders after prison is rarely exploited, therefore, needs urgent attention.

Accordingly, the problem gets worse for jails when the minor offender and re-offender overpopulate the jails. It has been estimated that there are about 10.35 million prisoners in jails globally by the Institute for Criminal Policy Research (Walmsley, 2016). According to Global Prison Trends (2018) overcrowding has reached crises level. To fix this problem many countries have moved unsustainable solutions by building more prisons. The policies of criminal justice affect the 2030 Sustainable Development Goals (SDGs) in every sphere of life, including human rights, poverty, well-being, human security, employment, governance, rule of law and access to justice.

With a global prison strength of about 10 million (Walmsley, 2016), it was estimated that 10 to 12% people in prison had major depression problems (Fazel& Seewald, 2012), and face a huge problem of post-traumatic stress disorders (Goff, Rose, Rose, & Purves, 2007). The prevalent mental health problems in prisons give rise to other harmful outcomes such as self-harm and deviant behaviors (Hawton, Linsell, Adeniji, Sariaslan, & Fazel, 2014), and there are major occurrence of commencing the offences again by the released prisoners (Chang, Larsson, Lichtenstein, & Fazel, 2015).

Moreover, within the pre-existing justice system amnesties and pardons are meant to provide relief to the grieved and discourage the offenders to commit crimes. It is estimated that amnesties and granted pardons do not provide long term relief. The usage of pardons erodes people confidence in the justice system and is not sustainable. Whereas, in Burundi, one-third of the prisoner population was pardoned and released that evoked criticism on justice system under allegation to provide relief to political prisoners (News 24, 2017). Not only that but in it was reported in the Czech Republic, that about 2,000 released prisoners out of a total 6,500 by amnesty reoffended and returned to prison in 2013. Moreover, current pardon and amnesties are short term solutions that in fact are compromising the correctional efforts through restorative programs within the conventional justice system. Thus, the current situation calls for an alternative to direct imprisonments laws and practices as required by UN Tokyo rules (1991).

The judicial system can impact the availability of a just and productive job for the local populace. In particular, one of the important post-prison restorative barriers is a past criminal record. This record haunts individuals who wish to live law-abiding lives after release from prisons. Similarly, the law has been documented in Costa Rica, to deleting the criminal record from the database for ease of released prisoners

to get employment and avoid societal discrimination to post-prison restorations (Walmsley, 2017). Where courts are legally allowed to delete the criminal record for the post-prison case between the time period of 3 to 5 years after their release. This law is quite verbatim on the facts which must be considered such as the offense committed, length of the sentence, and the vulnerability of the offender (determined by discrimination, social exclusion and poverty) at the time of commencement of the offense.

Further, the rest of the detainees are guilty of petty criminal activities and almost 60% of detained Indonesians are under drug abuse imprisonment which should be treated in healthcare facilities rather being prisoned. These people should be treated at a societal level instead of putting them behind the bars. Following this argument, Nagin et al. (2009) contended for restorative practices rather accepting all as criminals to prison. As a result, these conventional practices affect the individual emotions and sparks antisocial thoughts which later stimulates re-offense or post-prison violence among individuals and consequently dampen restorative process.

As per the SDG's it is the prime responsibility of the state to rehabilitate and re-integrate the offenders in this age of sustainable development. The leaders have to come forwards as critical thinkers of criminal justice policies by ensuring that 'no one is left behind' as per commitment to the SDGs by the states. Indeed, a system is needed that can monitor people rebuilding their lives in prison and contribute to safer societies based on restorative rehabilitation and sustainable developments, free from violence. Such that, The SDGs and Criminal Justice under Global Prison Trends 2017, urged research to work on restorative rehabilitation and reintegration of offenders to be able to meet the broader developmental goals with respect to communities' as determined by the 2030 Sustainable Development Agenda.

Literature reveals that development and justice have worked in isolation for ages now and they need to come up with integrated solutions to the criminal re-integration problem. To accomplish 'leave no one behind' commitment, states must collaborate and integrate with other authorities, private entities and the civil society as a whole in a more relative domain of justice. One of these authorities is 'restoration justice system'. In a similar argument, Lawrence, Mears, Dubin, and Travis (2002) highlighted the need for a more systematic assessment of these issues. Such as, in United Kingdom alone, restorative justice system saves £8 per case for every £1 invested in restorative justice system reported by ministry of justice evaluation final report (2008). Moreover, in UK, restorative justice system reduced recidivism by 27%. Though, researchers have developed important basic work in the area of correctional programming. Yet, there are critical integrational gaps exist between programming need and resources, as well as vast opportunities to improve restorative, rehabilitation, and social reintegration to enhance correctional efforts.

Though, Indonesia has the unique opportunity to deliver a just, modern, and substantive criminal justice system to its citizens as reported by the Conversation (2018). Yet, the criminal justice system as a law enforcement tool is inefficient (Pujiyono, 2015). Moreover, the Indonesian justice system is adopted from the Dutch system and has continued unabated since the last 73 years. Indonesian gov't spends

Rp2 billion for prisoners' food each year (The Jakarta Post, 2016). While reporting to the news, Ali said, "It would be better if the government could allocate such a high prisoner cost of living to other sectors, such as education". Specifically, Correction Director General in 2017 indicated 87% excess of correctional facilities (Bahuet & Kristensen, 2018). Moreover, Indonesia required 8000 trained restorative justice staff and till 2017, whereas, only 979 enforcers were certified. These may be the reason behind a colossal number of detained people at 250,000 approximately that is higher than 160,000 people figure of 2013. Consequently, mounting to 47% detainees over the prison capacity as reported by the Center for Detention Studies (CDS) as reported in the year 2017 as cited in The Conversation (2018). Therefore, intense efforts are needed to enforce restorative justice system (Bahuet & Kristensen, 2018).

Stated earlier deficiencies in the current Indonesian restorative justice system clearly crave for a new approach in restorative perspective and monitoring interventions. For example, Prison security system offered by 'M2SYS' is a visualization that involves data creation of prisoner by capturing demography of individual, stores the data with unique recognition identifications, applies analytics for relevant information, manages workflow accordingly and individual-based case profiles, monitors visitors, likewise manages medical facilities, and finally helps prepare reporting pertaining to individual prisoners. In short, a complete informative individual profile is intelligently managed by authorities with confidentiality and security of the system. Similarly, Prison Management Systems (PRISMS) is an e-governance initiative introduced in the Indian prison system to effectively and efficiently address prevalent lack of rule of law, compromised constitutional rights of prisoners and inefficient administration of prisons (Osama Manzar, 2013).

Right, above-mentioned cases are limited in the scope as both are concerned within prison or jail premises. This drawback is half done rather practically useable in case of an Indonesian restorative justice system, which is beyond boundaries of jail premises that in volves a large amount of data and monitoring. Therefore, it is rightly assumed to revisit restorative rehabilitation practices, rules, and procedure adoption in the Indonesian justice system in the light of Big Data analytics that has tremendous power to turn the tables around for the current deficiencies in Indonesian restorative justice system.

## II. Big Data Analytics

Tech America Foundation defined Big data as:

"Big data is a term that describes large volumes of high velocity, complex and variable data that require advanced techniques and technologies to enable the capture, storage, distribution, management, and analysis of the information." (Tech America Foundation's Federal Big Data Commission, 2012).

The big data was developed by Meta Group by describing three features called '3V'. This stands for Variety or formats such as structured, unstructured, or semi-structured data, Velocity or speed at which data is created and finally the Volume or amount of data created. While, IBM has added the analytical techniques known as the fourth V called Veracity applied on data and completely based on the quality of data.

However, Oracle has added the value additions by a fifth V called Value (see fig: 1) in the Big Data (Baaziz & Quoniam, 2013).
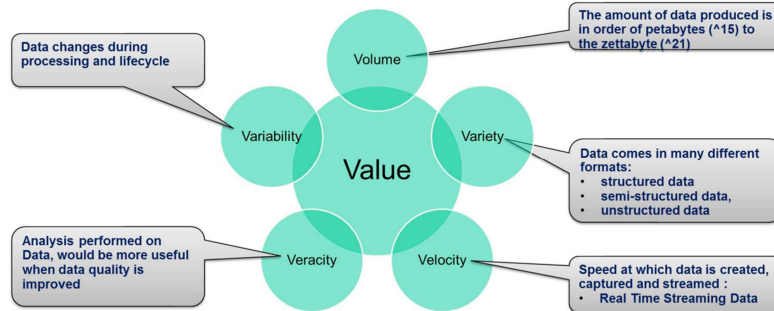


**Fig. 1:** The "6V" of Big Data "

Big data technologies describe the architectures of next generation to economically extract value from Big variety of datasets. These datasets shall enable the analysis, discovery and velocity capture of data (Feblowitz, 2012) while ensuring the veracity and integrity by automatic quality control to get Big value.

Big data are worthless without analytical techniques. The value of big data value is ascertained when it is utilized to drive decision making. To enable such kind of a potential from Big Data it is required to have efficient processes within organizations to turn the diverse data into meaningful information. Extracting information from Big data may be classified into five broad steps (Labrinidis & Jagadish, 2012). These steps consist of: data management which involves process supporting technologies, storing of data, prepare, and retrieve the data for analytics. Secondly, it may be required to apply suitable analytical techniques that may be utilized to infer information from the big data.

Big data analytics have a long list and a big scope to cover. Thus, few techniques are briefed below:

### II.i.  Text Analytics/Text Mining

This technique is utilized on textual data to extract information. A diverse variety of textual data exists such as call center blogs, news, corporate documents, survey responses, online forums, blogs, emails, feeds and social network. The analysis of such text may be done by using machine learning, computational linguistics, and statistical analysis. This analysis yields meaningful summaries that are useful for institutions for decision making. For example, such text data may be utilized on financial news and market-based information to get stock prices (Chung, 2014).

### II.ii.  Question Answering (QA) Techniques

QA technique provides answers to questions posed to the computer in natural language by a user. Thus, QA works on the basis of Natural Language Processing techniques.  IBM's Watson and Apple's Siri are examples of such QA systems available commercially. These systems have been successfully integrated into marketing, healthcare, finance and educational sectors.

## II.iii. Sentiment Analysis Technique

The SA technique analyzes texts that hold people sentiments or opinions about events, products, organizations, services, or individuals. Businesses are capitalizing on this technique to give insights into the customer opinions (Liu & Zhang, 2012). Thus, social sciences, finance, political thought process and marketing are the major application fields of sentiment analysis. This technique analyses the given text at the sentence level, document level, and at the aspect level and is focused on extracting negative or positive sentiments from the textual dataset (Feldman, 2013).

## II.iv. Audio Analytics

Audio or speech analysis is applied to human spoken language. Currently, customer call centers providing healthcare are primary users of this technique. For example, in medical call centers the audio analytics processes thousands of calls with millions of hours of duration to enhance sales turnover rate and improve customer experience also aiding in the evaluation of agent performance. Meanwhile, it can also be utilized to recommend cross-selling based on consumption behaviors of customer in the past.

Audio analytics is used widely in healthcare to support the diagnosis and treatment of diverse medical conditions of patients related to their speech or communications (Hirschberg, Hjalmarsson, & Elhadad, 2010), and to gauge infant's emotional health and status from infant's cries (Patil, 2010).

## II.v. Social Media Analytics:

Social media can be applied to a variety of structured and unstructured data gathered from a number of platforms. It can be categorized as review sites (e.g., Trip Advisor), media sharing (e.g., Instagram), social news (e.g., Reddit), blogs and a social networks such as (Facebook, twitter etc.), (Barbier& Liu, 2011; Gundecha& Liu, 2012). Also, many mobile applications provide a platform for social interaction such as Find my friend.

## II.vi. Predictive Analytics

Predictive analytic techniques are mainly supported by statistical methods. Predictive analytics is a suite of techniques that harness and predict future outcomes from current and historical data. Practically, predictive analytic techniques are useful to almost all disciplines for example from jet engine failure from thousands of sensors and stream of past data to customer's next move based on what, when, what and where the context is said on the social media. At the core, predictive analytics approaches patterns and captures relationships in data.

At the humongous scale in China alone, 1.4 billion citizens will be under the umbrella of big data by 2020. Where citizens would be tracked, traced, and ranked and assigned social credits to enjoy societal benefits (Liang, Das, Kostyuk, & Hussain, 2018). Therefore, it is of no surprise to consider and explore further to integrate big data analytics in Indonesian correctional justice system.

Furthermore, in most practical form big data are more flexible even at large scales. For example, Facebook in 2014, processed 10 billion messages, 4.5 billion Like actions, and 350 million photos every single day (Marr, 2014), and developers kept refining their algorithms, terms, and conditions according to what and how data were generated (Bucher, 2012).

Accordingly, restoration institutions may receive individual data through links or IDs. Collected data will follow data processing steps that will convert data into information and later this information can be used under the strict control of specific authorities as per terms and conditions under the judicial system.

The judicial system may find use of the big data analytics to yield answers to the most vital questions posed such as; what are client's success chances in litigation? What is the danger posed by a potential parolee to the community? Where is the most effective deployment of the police resources? Thus, it is suggested that Big data and big datasets coupled with the right analytic techniques may yield simple answers to complex questions (Moses & Chan, 2014)

### III. Restorative Justice from Big Data Perspective

Restorative justice is a correctional justice system that involves amongst the offender and the victim. It is representative of the social community and allows the offenders a fair chance to reintegrate within that community. It is evident from various studies that the restorative practices encourage remedy and reduce repeat offences by the offenders (Sherman et al., 2007). Shap l and (2008) found that restorative justice reduced recidivism by 27% among individuals in the UK. The respondents expressed for the process as a positive and helpful experience. Researchers concluded that victim-offender is benefited from restorative mediation. Such as, a study by Bradshaw, Rose borough, and Umbreit (2006) show satisfaction of the offenders with the restorative process as well as less tendency towards recidivism. Hence, practiced in many countries like USA, UK, South Africa (Venter & Rankin, 2006), New Zealand (Galaway, 1995), and Germany (Hartmann, 2008).

Indeed, restorative practices have deeper societal and governance impact in the long run. Specifically, in Indonesia, the restorative justice system is incorporated in 2014 under child protection law, though only for children at this stage, has sparked interest throughout the justice and legal system. The National Development Planning Agency (Bappenas) since 2017, has called for academicians and non-government bodies to discuss and explore strategies that would help enforce restorative justice system effectively.

In this regard, Bappenas has deployed a restorative justice system in Aceh, Sumatra. Where they have an autonomous body called 'gampong' to settle the issues of reoccurrences locally (Hukum, 2018). This way of restoration brings both victim and offender in front and explain the grievance in the presence of a community that also accepts the decision. This in other words, later translated into social acceptance and comfort for the offender as well as victim family and reduces risks of recidivism and petty crimes.

The RKUHP shall be the cornerstone of the Indonesian justice system impacting all of the major reforms towards restorative cultures and communities. Whereas, new offenses or re-offense will be a challenge for already overwhelmed prisons with financial load on government as well. As the in Jakarta only, prison living costs are the US $ 4 per day and only half of it is paid by government reported in The Conversation (2018). This indicates that the Director-General Correction faces many challenges. Here the author argues to track the post-prison performance of individuals and upon achievement of certain tasks or criteria, the individual might set free in terms of record deletion. In other words, through data management system and analytics, pre-and post-prison data of the subjects can be integrated and collaborated over formal platforms such as courts, and relevant authorities such as restorative institutions (Bappenas) to track and trace for fulfillment of certain standard.

Accordingly, Kristiansen and Trijono (2005) investigated deregulation and decentralization of the reforms that torment the existing security and law enforcement system. Authors observed a total lack of transparency and accountability in security affairs. While, recommended increased monitoring in security, policing, and law enforcement. Therefore, this study contends to avail the great possibilities and opportunities to reshape restorative and correctional programming from micro to macro level implications, as compared to the traditional justice system that marginalizes the offender (Rea, 2012).

## IV. Implications

Integration of analytics with the help of big data in the judicial system may elevate illegal practices within the system as highlighted by Butt and Lindsey (2010). Thus, benefits from big data will truly restore, rehabilitate, and reintegrate of people in digital era may lead the Indonesian judicial system, particularly, for overall correctional well-being of the society in general.

Whereas, specifically, criminal records of offenders to gain employment after release from prison which is also a big concern for restorative institutions. Big data analytics will enable policymakers to reconsider within the conventional judicial system to avoid discrimination and shall allow the possibility of decent, productive and respectable work for the offenders.

Big Data analytical tools will enable restorative enforcers would have pre-existing information about red areas which need more focus. Thus, efficient resource allocation will also be cost-efficient and effective as compared to conventional restorative trends.

The article educated stakeholders not only about the theoretical importance but also the practically feasible with impactful benefit to the judicial system in general. For instance, big data application and implication is already existing in modern healthcare sector such that doctors can monitor patient's EMR imaging, insurance claims, medicine doses, data from smartphones, sensors, and tools. Where, at next step data is analyzed through different analytical techniques (Monteith, Glenn, Geddes, & Bauer, 2015).

The resources such as restorative institutions or centers, enforcers, lawmakers, and judicial system will be helped to manage and efficiently allocate their limited resources. Timely implementation will not only shed prison overload but also reintegrate individuals with precise monitoring which eventually will save billions of Indonesian Rupees. Whereas, monitoring with preciseness, information that is relevant, a prediction that is accurate collectively will have a huge impact on overall restorative programs and Indonesian correctional justice system.

## V. Conclusion

The far seen benefits of Big Data analytics in the restorative justice system is undoubtedly fruitful, financially as well as practically, yet, unexplored. This article is one of the base stones to enlighten Indonesian restorative justice system judicial system architecture into the digital era. Addressing current issues and suggesting solution requires field testing and evaluations. Therefore, researchers may use this effort as a platform to echo into different directions that may reflect help for restorative institutions for post-prison rehabilitation and reintegration into society. Moreover, studies must dive deep to extract tailor-made solutions that are beneficial for the correctional justice system and lawmakers. Therefore, research is urged to focus through the lens of Big Data and analytics into less aware justice system from a digital monitoring perspective, particularly, in developing countries from the Asian context with limited resources and compromised management.

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